PAN-PACIFIC ENTOMOLOGIST
July 1981, Vol. 57, No. 3, pp. 422–428

A REVISION OF THE GENUS *NIPHOGENIA* MELANDER (DIPTERA: EMPIDIDAE)

D. DEE WILDER[1]

California Academy of Sciences, Golden Gate Park,
San Francisco 94118

A. L. Melander erected the genus *Niphogenia* for the single species, *eucera,* in 1927. Since that time, nothing has been written about these unusual flies, and until recent years very few have been collected. The purpose of this paper is to better define the genus, to make available some behavioral observations, and to describe one new species.

Niphogenia adults are readily distinguished from other empidids belonging to the subfamily Clinocerinae by the remarkably lengthened third antennal segment (Fig. 1). *Ceratempis longicornis* adults also have the third antennal segment elongate, but they lack an antennal style and acrostichal setae.

Most clinocerines are associated with water, the larvae being aquatic and the adults occurring on rocks in or at the edge of streams. In these genera, prey is taken from the water in some way. *Niphogenia,* a primitive clinocerine, is not aquatic.

I have observed *N. eucera* adults on various occasions at elevations from 1150 to 1830 m on alpine meadows in the Cascades. These flies are often abundant, but not easily collected with a sweep net because they rest, feed, and mate on the surface of the soil or on very low-growing vegetation. Only in areas of extreme abundance are specimens seen on taller vegetation. They are found on moist soil, sometimes associated with small streams from melting snow, but are not as intimately associated with the water as are most other clinocerines.

Individuals of *N. eucera* feed on insect larvae (and perhaps other soft-bodied arthropods) which they unearth from the soil. They move the loose soil with their tarsi until an individual unearths a larva. Other adults immediately converge on the prey, pull it from the ground, and tear it to pieces, each individual eventually devouring its own small portion (Fig. 2). I have observed feeding behavior only in localities where the flies were present in large numbers, and it is likely that such dividing of food does not take place where the density of individuals is not as great.

Despite the large number of females I have collected and observed, the males are represented by only a few specimens. The males may emerge earlier and mate with the females when they are still teneral, passing their

Figs. 1–2. Fig. 1. *Niphogenia eucera,* female, habitus. Fig. 2. *N. eucera* females feeding.

peak density at a time earlier than the dates of collection. Mating behavior in this species was observed only once, the coupling taking place on a low-growing leaf in a locality where many *N. eucera* were present. The female was teneral.

The following generic description is an expansion of Melander's (1927) original description of the genus.

Niphogenia Melander

Niphogenia Melander, 1927:217. Type-species, *eucera* Melander (by original designation).

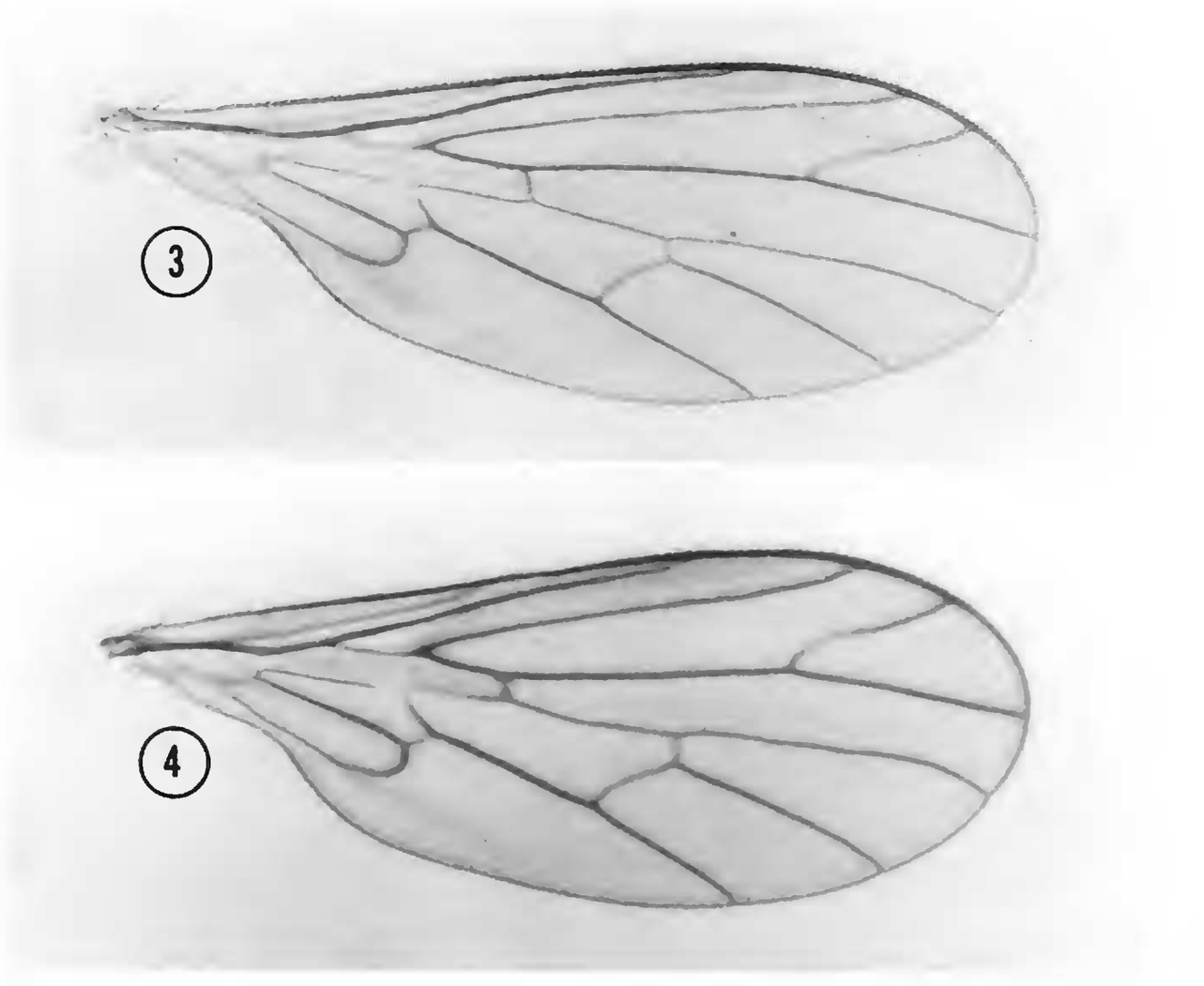
Description.—Delicate empidids with lengthened antennae (Fig. 1). *Head* round; eyes round, bare, facets uniform. Face wide, convex, protruding in

female, continuous with the small genae, its lower edge straight; front broad, more so in female, diverging from antennae to ocellar triangle, a small excision in the eyes at antennae, a few small setae on front above excision. Ocellar triangle slightly elevated with one pair of strong ocellar and several small post-ocellar bristles. Two to three poorly defined rows of strong occipital bristles, one row of strong setae ringing occipital foramen laterally and ventrally. First antennal segment cylindrical, more than twice as long as the globose second segment, both with a few small setae; third segment more than twice as long as the first two, slightly tapering, shorter and strongly tapering in female, loosely pubescent, tipped with a small bristle. Proboscis short, sharp, with fleshy labella, palpi elongate oval, with a few setae; oral opening ringed with hairs laterally and ventrally. *Thorax:* Pronotum with a row of short, stiff bristles; mesonotum with two rows of dorsocentrals and a single median row of acrostichals, 2–3 humerals, 1–2 posthumerals, 2–3 notopleurals, one each prealar, supraalar, postalar, two scutellars; metapleuron with a cluster of hairs; proepisternum with bristles above coxal bases. *Legs* slender, not bristly, coxae setose; tarsi longer than their tibiae, pulvilli small, empodium microscopic. Hind tibia with dorsal bristles; middle tibia of males with small, thorn-like flexor spines on apical portion. *Wings* with anal angle projecting only slightly, costa encompassing wing, costal bristle present, small; subcosta weak, complete; R_{4+5} forked, discal cell complete, emitting three veins; the first basal cell considerably longer than the second; anal crossvein curving into lower side of anal cell, no anal vein, anal cell subequal to second basal cell. Calypters with a nearly straight edge and weak fringe. *Abdomen* cylindrical, segments loosely setose with small pittings along base of second segment and with two visible (three total) laterally on segments 3–7. Pygidium with lateral valves elongate, but usually folded mesally and ventrally, appearing globular; dorsal process of lateral valve long, slender and pointed; aedeagus erect with a long, slender basal appendage; cerci large and erect. Female with seventh sternite polished apically.

Key to the Species of *Niphogenia* Melander

1. General body color brown, legs light brown to yellow; males with comb on apical half of middle tibia strongly differentiated (Fig. 6); hypopygium with dorsal process of lateral lobe not reaching apex of lateral lobe (Fig. 10), not crossing or crossing only at tips in folded hypopygium (Fig. 8); females with proboscis a broad triangle, setose, narrowed to a rounded apex (Fig. 13) .... *eucera* Melander

   General body color black, legs brown to dark brown; males with comb on apical third of middle tibia weakly differentiated (Fig. 5);

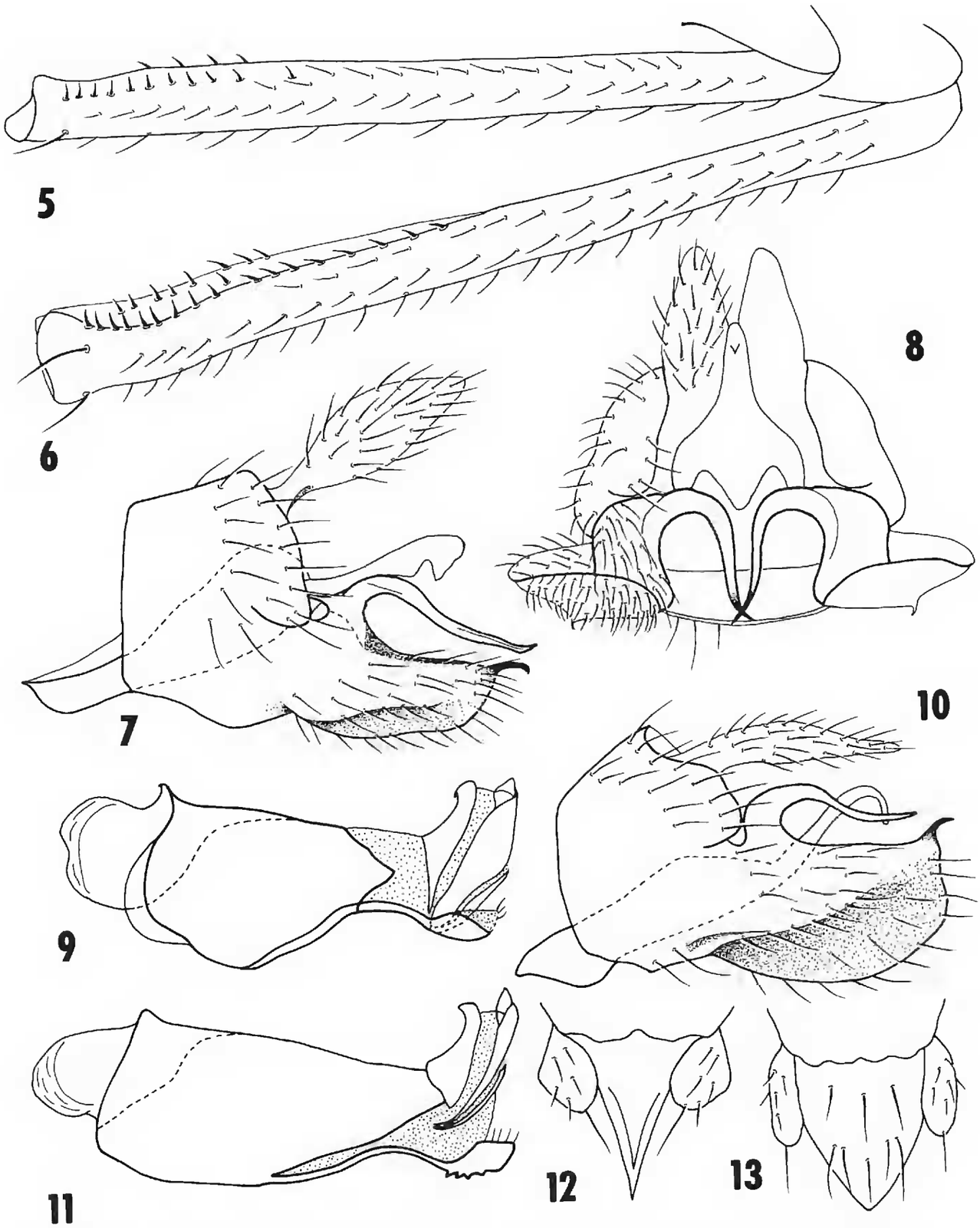


Figs. 3–4. Fig. 3. Wing of *N. eucera* male. Fig. 4. Wing of *N. turneri* holotype.

hypopygium with dorsal process of lateral lobe surpassing apex of lateral lobe (Fig. 7), crossing at bases in folded hypopygium; females with proboscis a narrow triangle with a sharp, pointed apex (Fig. 12) ..... *turneri,* new species

Niphogenia eucera Melander
(Figs. 1–3, 6, 8–10, 13)

Description.—Body length 2.5 to 4.0 mm, females usually larger than males; coloration brown to dark brown, covered with brownish grey tomentum. *Head:* One pair of ocellar bristles subequal in length to first antennal segment. Antennae brown, with first two segments often lighter than third; third with loose, pale pubescence; ratio of segments 2:1:10. Oral margin ringed laterally and posteriorly with stiff hairs. *Thorax:* One long posthumeral bristle, two or three notopleurals; pleural suture and halteres pale. A clump of setae on proepisternum above front coxa, setae stronger than those of front coxae. Coxae yellow; legs concolorous light brown or yellow,



Figs. 5–13. Fig. 5. Middle tibia of *N. turneri*. Fig. 6. Middle tibia of *N. eucera*. Fig. 7. Hypopygium of *N. turneri* holotype. Fig. 8. Folded hypopygium of *N. eucera*. Fig. 9. Female genitalia of *N. eucera*. Fig. 10. Hypopygium of *N. eucera*. Fig. 11. Female genitalia of *N. turneri* allotype. Fig. 12. Proboscis of *N. turneri* female. Fig. 13. Proboscis of *N. eucera* female.

tarsi sometimes darker. Middle tibia slightly swollen apically; a row of 14–17 short setae on anteroventral surface of apical half; a few thorns present on ventral surface. Wings brown, yellowish at base, venation as in Fig. 3. *Abdomen* brown, lightly tomentose, shining. Terminalia with pointed dorsal processes of lateral lobe not reaching apex of lateral lobe, not crossing at all or crossing only at tips in folded hypopygium. Female: Generally the same as male. Proboscis wide, spade-shaped, setose, narrowed to a rounded apex. Genitalia as figured (Fig. 9).

Type material.—Holotype male, Paradise Park, Mt. Rainier National Park, Washington, August 1917, A. L. Melander. Allotype female with the same data. These specimens are deposited in NMNH.

Diagnosis.—Members of this species can be distinguished from those of *N. turneri* by the following combination of character states: Color light brown, tomentum weak, legs and coxae distinctly lighter than rest of body; comb of middle tibia strongly differentiated, male and female genitalia distinctive (Figs. 8–10).

Specimens examined.—(DDWC indicates specimens in my personal collection, other acronyms are listed in acknowledgments.) Total number of specimens examined was 362. CALIFORNIA: Plumas Co., 8 mi. [12.8 km] S.E. Mt. Lassen, 8 July (WSUC). OREGON: Clackamas Co., Mt. Hood, Lost Lake, 3000 ft. [ca. 910 m], 10 July; Still Creek Campground, 1150 m, 23 June, 27 June (CASC, CNCI, DDWC, NMNH, WSUC). Hood River Co., Mitchell Creek near Sahalie Falls, 1400 m, 27 June; Mt. Hood Meadows, 1350 m, 27 June (DDWC). WASHINGTON: Clallam Co., Olympic Nat. Park, Hurricane Ridge, 21 July; nr. Hurricane Ridge Lodge, 4 August; Meadow below Sunrise Ridge, Mt. Angeles, 1550 m, 22, 23, 24 July (CASC, CNCI, DDWC, WSUC). Mt. Rainier Nat. Park, along creek draining E end Yakima Park, 1830 m, 3 August; Eagle Peak, 19 July; Edith Creek at Paradise Park, 1650 m, 2 August; Frog Pond, Paradise Valley, 20 July; Paradise Park, August; Van Trump Creek, 1 September (CASC, DDWC, NMNH, WSUC).

Remarks.—This species is found in moist areas in the Cascades at elevations from 1150 to 1830 m. Adults occur on the surface of the soil or on low-growing vegetation and may be quite abundant at times.

Niphogenia turneri, new species
(Figs. 4, 5, 7, 11, 12)

Description.—Body length 2.5 to 4.0 mm, females usually larger than males; coloration dark brown to black covered with heavy grey tomentum. *Head:* One pair of ocellar setae slightly shorter than first antennal segment. Antennae with all segments concolorous dark brown to black; third with loose grey pubescence; ratio of segments 2:1:9. Oral margin ringed laterally

and posteriorly with a few fine hairs. *Thorax:* One posthumeral, two notopleural bristles; pleural suture concolorous with rest of thorax. A clump of setae on proepisternum above front coxae, setae about as strong as those of front coxae. Coxae light to dark brown, sometimes darker dorsally; legs brown to black. Middle tibia with a row of 8 to 10 weakly-differentiated setae on the anteroventral surface of the apical third; a few small setae on ventral surface. *Wings* brown, yellowish at base, venation as in Fig. 4. *Abdomen* dark brown to black with heavy greyish or greenish tomentum, shining. Terminalia (Fig. 7) with pointed dorsal processes of lateral lobes surpassing apex of lateral lobe, crossing at bases in folded hypopygium. Female: Generally the same as the male, proboscis an elongate triangle, narrowed to a sharp, pointed apex (Fig. 12). Genitalia as figured (Fig. 11).

Type material.—Holotype male, IDAHO: Idaho Co., South Lone Lake, 13.5 airline miles NNE of Selway Falls. R10E/T33N/Sec. 11. 6480 ft. [ca. 1975 m]. 17 July 1979. Sweep. W. J. Turner. Allotype, a female with the same data. The holotype and allotype are deposited in the California Academy of Sciences (Type No. 13638).

Diagnosis.—Members of this species can be distinguished from those of *N. eucera* by the following combination of character states: Body color dark, legs and coxae dark; comb on middle tibia weak, male and female genitalia distinctive; females have a narrowly triangular, sharp proboscis.

Specimens examined.—(23.) 3 male, 14 female paratypes from the same locality and date as the holotype. 6 female from IDAHO: Idaho Co., East Peak Lake, 12.7 airline mi. NNE Selway Falls R10E/T33N/Sec. 14, 6360 ft. 16 July 1979, W. J. Turner (WSUC, NMNH).

Remarks.—Nothing is known of the habits of this species. *Niphogenia turneri* is named in honor of its collector, Dr. William J. Turner.

Acknowledgments

The following institutions and curators kindly loaned the specimens upon which this study was based: L. V. Knutson, National Museum of Natural History (NMNH), H. J. Teskey, Canadian National Collection (CNCI), and William J. Turner, Washington State University (WSUC). I am indebted to Dr. D. H. Kavanaugh, California Academy of Sciences, for providing space, facilities, and encouragement.

Literature Cited

Melander, A. L. 1927. Diptera. Family Empididae. Fasc. 185, 434 pp., 8 pls. *In* P. Wytsman, ed., Genera insectorum. Bruxelles.

Footnote

[1] Present address: Systematic Entomology Laboratory, IIBIII, Agricultural Research Service, U.S.D.A. % U.S. National Museum, Washington, D.C. 20560.